

ABSTRACT

This invention mainly provides a single-chip structure of silicon-germanium (SiGe) photodetectors and high-speed transistors. Primarily inserting a specified photo-absorbing layer in the
5 photodetector, this device structure then provides the capability to absorb the light spectrum with an infrared wavelength, but also improves the overall optical absorption efficiency indeed. Then consider both the photodetector and the high-speed transistor have similar structures, therefore they can be well integrated on the same
10 substrate by using the single-chip technology. Furthermore, one separated insulation layer will be adopted to isolate the photo-detecting zone and the high-speed transistor zone. Consequently, a single-chip structure of the SiGe photodetector and the high-speed transistor will be implemented.

15